MHD Seismology of the Solar Corona with SOHO and TRACE

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Recent discoveries of MHD wave motions in the solar corona (slow magnetoacoustic waves in polar plumes and long loops, oscillations of coronal loops, coronal Moreton waves) done with EUV imaging telescopes onboard SOHO and TRACE provide an observational basis for the MHD seismology of the corona. Measuring the properties of MHD waves and oscillations (periods, wavelengths, amplitudes, temporal and spatial signatures), combined with theoretical modelling of the wave phenomena, allow us to determine values of the mean parameters of the corona (the magnetic field strength, transport coefficients, etc.). As an example, we consider post-flare decaying oscillations of loops, observed with TRACE (14th July 1998 at 12:55 UT). An analysis of the oscillations shows that they are quasi-harmonic, with a period of about 265 s, and quickly decaying with the decay time of about 14.5 min. We interpret these oscillations as a standing kink global modes of the loops. The period of oscillations allows us to determine the Alfvén speed in the oscillating loop about 770 km/s. This value can be used for deduction of the value of the magnetic field in the loop (giving 15-25 G). The decay time, together with the assumption that the decay is caused by viscous (or resistive) dissipation, gives us the Reynolds number of $10^{5.3-6.1}$ (or the Lundquist number of $10^{5.0-5.8}$). Other possible means for the oscillation decay, such as wave leakage and linear and nonlinear wave coupling are estimated.